

**TABLE HAVING AT LEAST TWO CANTILEVER EXTENSIONS HINGED
ON TO A FIXED TABLE TOP**

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DESCRIPTION

The present invention refers to an extensible table, which is provided with at least two cantilever extensions coupled to a fixed table top by hinging means. In a table of this kind, the extensions, when in the retracted condition thereof, are suspended under the fixed table top, whereas, when extracted, they enable the available surface of the table to be increased by extending it in one or more directions.

The most relevant state of the art in this connection is represented by the international patent application filed by this same Applicant, and published under No. WO-A-02 054 908, in which both the fixed table top and the extensions of a table are made out of thick crystal (tempered glass) panes having mutually opposed, parallel section planes that are inclined relative to the useful surface. The hinges have their axes extending orthogonally to said section planes and enable the extensions to be extracted and retracted by a simple 180°-rotation.

In particular, each one of the hinges in the second embodiment described in the above-mentioned prior-art disclosure comprises a bushing that is firmly joined to a wing attached to the lower face of an extension. This bushing is capable of rotating between two head pieces that are firmly joined with each other, one of said piece being secured to the lower face of the fixed table top.

Since there is nothing to actually prevent an extracted extension from retracting under a horizontal force being exerted thereagainst, quite clear is the drawback that may derive if a force of this kind is unintentionally exerted when the surface of a extracted extension is being used, e.g. by a person sitting at the table while having a meal.

It therefore is a main object of the present invention to provide an extensible table that is an improvement of the above-mentioned prior-art table, in that it is provided with means adapted to ensure full stability of the table extensions when in their extracted configuration.

In accordance with this object of the present invention, the hinges used to support the extensions have been given a construction that partly differs from the previously used design, while however further ensuring an unaltered level of convenience for the user in protracting and retracting the extensions themselves.

5 These and further objects of the present invention are reached in a table having the features and characteristics recited in the appended claims, as this will be more readily understood from the description that is given below by way of non-limiting example of embodiment with reference to the accompanying drawings, in which:

- 10 - Figure 1 is a side, partially sectional view of the contiguous portions of the fixed table top and an extension, along with the related hinge, in a table shown in the configuration corresponding to an extracted extension;
- Figures 2 to 4 are views illustrating the operating sequence of the hinge when bringing the extension from the extracted configuration shown in Figure 1 into the
- 15 retracted configuration thereof;
- Figures 5 and 6 are views illustrating the operating sequence of the hinge when bringing the extension from its retracted configuration shown in Figure 4 into its extracted configuration shown in Figure 1;
- Figure 7 is a view of a detail of the hinge that is part of the table.

20 In Figure 1, which relates to a table according to the present invention, the following parts are illustrated :

- a fixed table top 10, made out of a crystal, i.e. a tempered glass pane having preferably a wall thickness of approx. 15 mm, wherein the upper and lower faces of which are indicated at 12 and 14, respectively. The fixed table top 10 (of
- 25 which only the portion terminating with a section plane 16 inclined downwards towards the centre of the table are shown) actually, rests on a rigid support structure which, owing to its having no direct relevance to the present invention, is not shown in the Figure, but can for instance be the same as the one disclosed in the above-discussed patent application WO-A-02 054 908, to which reference is
- 30 made for further details;

- an extension 20, which is itself made out of a crystal or tempered glass pane having the same wall thickness as the fixed table top 10, wherein the upper and lower faces thereof are indicated at 22 and 24, respectively. The extension 20

is supported in a cantilevered manner by the fixed table top 10 with the aid of articulated support means that shall be described in greater detail further on. The extension 20 has a section plane 26 that is adapted to move into abutting against the corresponding section plane 16 of the fixed table top 10 when the extension is in the extracted configuration thereof, so that it is inclined and parallel to the same section plane 16. On the lower face 24 of the extension 20, very close to the section plane 26, there is attached (e.g. bonded with the use of a silicone-based adhesive) a disc 30 having two vertical wings 32 to receive a stud 34, which is part of the afore-mentioned articulated support means, and the horizontal axis X of which is parallel to the section planes 16 and 26. Onto this disc 30, in a position that is closer to the section plane 26 of the extension 20 than the stud 34, there is finally screwed the stem 36 – extending orthogonally to the faces 22 and 24 of the same extension 20 – of a first retaining member 35 that further comprises a head 37. This head is in the shape of substantially a triangular prism having a base 38 parallel to said faces of the extension 20 and – at a certain distance from said base – an undercut 39;

- a hinge, which is generally indicated at 100 and is also part of the afore-mentioned articulated means provided on the fixed table top 10 as a support for the extension 20, the axis Z thereof being orthogonal to the section planes 16 and 26.

The hinge 100 comprises:

- a cylindrical bushing 110, inside which there is housed a spring 112 extending along a diameter of the same bushing. To this spring 112 there are attached two small terminal blocks 114 serving the purpose of retaining the spring between a pair of longitudinal grooves (not shown, for a better clarity) of the cylindrical bushing 110. From the outer surface of the bushing 110 there extends a wing 116, whose upper and lower faces are indicated at 118 and 119, respectively. On the free end portion 117 of the wing 116 the stud 34 supporting the extension 20 is mounted in a freely rotatable manner about the horizontal axis X. A pair of adjacent slots 120 and 122 are further provided, in a central position, on the wing 116. The first slot 120 has a larger size than the second slot 122 and comprises a narrower appendix 124 facing the stationary top surface 10 of the table. This appendix 124 – whose shape can be seen in Figure 7, which is a partial top view of the wing 116 – is not a fully open, i.e. of through-passing design, but is only open on the upper face 118 of the wing 116; however, it is connected via a hole 126 having a circular

cross-section with the second, narrower slot 122 that opens on the lower face 119 of the wing 116 only. A second retaining member 130 is associated to the wing 116, the said member 130 comprising a mushroom-shaped head 132, a stem 134, a retaining spring 136 and a small terminal block 135. Specifically, the head 132 is adapted to be received in the appendix 124 of the first, larger slot 120, whereas the stem 134 is adapted to slide, jointly with the small terminal block 135 screwed on to the stem 134, through the hole 126 connecting the two slots 120 and 122 with each other. To the lower face 119 of the wing 116, below the second retaining member 130, there is attached a third retaining member 140 comprising a piston capable of sliding, in a direction parallel to the wing 116, in a sleeve 138 provided with a slit 139 in correspondence to the aperture of the second slot 122. The head 142 of this piston is flattened and inclined downwards under the corresponding aperture of the first slot 120, and the piston itself is biased by an opposing spring 144, whose tension can be adjusted by means of a nut 146 screwing on the stem 148 of the same retaining member 140. Unlike all other above-described parts, which are preferably made of stainless steel, the springs 112, 136 and 144 are made of music wire;

- a first disc 150 that retains the spring 112 housed in the bushing 110 from above and has a perfectly smooth and flat upper face 152 so as to enable it to be properly attached, e.g. by bonding with a silicone-based adhesive, to the lower face 14 of the fixed table top 10;
- a second disc 160 that is rigidly coupled to the first disc 150 by means of screws (not shown for reasons of greater simplicity) provided inside the bushing 110, in order to ensure that the same bushing 110 is capable of rotating about the axis Z, as this shall be explained in greater detail further on.

When the extension 20 is to be brought into its retracted position from the extracted configuration thereof shown in Figure 1, the mode of operation of the above-described arrangement is as follows. In the extracted configuration shown in Figure 1, the section planes 16 and 26 are abutting against each other, while the head 37 of the first retaining member 35 is housed within the first slot 120 and, owing to the base 38 of the same retaining member 35 lying below the head 132, keeps the second retaining member 130 in a raised position. The third retaining member 140 is in turn in such a position as to cause the head 142 thereof to lie in

correspondence to the aperture of the first slot 120 in the lower face 119 of the wing 116.

Now, in order to retract the extension 20, the user must grasp the free end portion thereof with his/her hands and lift it, i.e. rotate it anti-clockwise about the horizontal axis X by making use of the connection between the stud 34, which is associated to the extension 20, and the wing 116, which is associated to the fixed table top 10. In this way, the head 37 of the first retaining member 35 moves away from the second retaining member 130, thereby displacing downwards so as to move through the entire thickness of the extension and slip out of the lower face 119 of the wing 116. Towards the end of this displacement thereof, the head 37 of the retaining member 35 strikes against the inclined head 142 of the third retaining member 140, which is in this way pushed towards the fixed table top 10 – see Figure 2.

At the end of said displacement, the head 142 of the third retaining member 140 eventually abuts against the undercut 39 provided on the head 37 of the first retaining member 35, thereby positively preventing the extension 20 from being capable of rotating about the horizontal axis any further – see Figure 3.

Upon reaching this position, the user pushes the extension 20 to turn relative to the fixed table top 10 by 180° about the axis Z, since the bushing 110 of the hinge 100 is capable of turning jointly with the wing 116 relative to the discs 150 and 160, while however maintaining unaltered the arrangement of the retaining members 35, 130, 140 relative to each other, as well as the arrangement of the stud 34 on the wing 116. At the end of this rotation, the extension 20 lies in its retracted configuration, i.e. under the fixed table top 10 – see Figure 4.

When on the contrary the available top surface of the table has to be enlarged, i.e. the extension 20 has to be pulled out from the retracted position thereof under the fixed table top (configuration illustrated in Figure 4) and brought into its extracted configuration, the user must first of all rotate the extension 20 with the bushing 110 of the hinge 100 by 180° relative to the fixed table top 10 about the axis Z in the opposite direction and in the reverse order with respect to the afore-described procedure, while anyway keeping unaltered the arrangement of the retaining members 35, 130, 140 relative to each other, as well as the arrangement of the stud 34 on the wing 116. At the end of this rotation, the extension 20 and the hinge 100 will lie in the configuration shown in Figure 3.

To bring the extension 20 into the extracted configuration thereof, the user must at this point grasp the free end portion thereof with his/her hands and lift it further, i.e. rotate it anti-clockwise on the stud 34 about the horizontal axis X up to the point at which the lower edge of the section plane 26 of the same extension 20 comes to touch the upper face 118 of the wing 116. This rotation is made possible by the stud 34 cooperating with the wing 116 and results in the head 37 of the first retaining member 35 disengaging from the head 142 of the third retaining member 140. This disengagement is permitted by the displacement of the piston 140 caused by the action of the biasing spring 144, and it in turn enables the second retaining member 130 to slide downwards within the connecting hole 126 and the narrower slot 122 of the wing 116. This sliding motion comes to an end when the head 132 of the same second retaining member 130 lies fully within the appendix 124 of the larger slot 120 of the wing 116 – see Figure 5.

Finally, the user lowers the extension 20, i.e. rotates it clockwise on the stud 34 about the horizontal axis X, and this results in the head 37 of the first retaining member 35 moving upwards within the slot 120 of the wing 116 – see Figure 6. The lowering movement of the extension 20 comes of course to an end when the section plane 26 thereof eventually abuts against the section plane 16 of the fixed table top and the base 38 of the first retaining member 35 lies again under the head 132, so as to keep the second retaining member 130 in a raised position – see again Figure 1. It is exactly the first retaining member 35 interacting in this way with the second retaining member 130 that is effective in retaining the extension 20, i.e. to make it stable and fixed in the extracted configuration thereof by preventing the same extension to accidentally retract under the action of a force exerted against it in a horizontal direction.

While the preceding description is referred to a preferred embodiment of the present invention, it will be appreciated that, within the scope defined by the appended claims, a number of other embodiments and variations thereof are possible. In particular, it shall be appreciated that the table may comprise any desired number of extensions, although such number is usually not higher than four when the fixed table top is square or rectangular in its shape, and not just a single extension as described above.
